

REMARKS

Claims 1-14, 25-31 and 41-57 remain in the application. Reconsideration of the application in view of the remarks to follow is requested.

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Claims 1, 2, 7, 9, 41 and 51-57 stand rejected under 35 U.S.C. §102(e) as being anticipated by Araki et al., U.S. Patent No. 5,882,994. Claims 3-6, 8, 10-14, 25-31 and 43 stand rejected under 35 U.S.C. §103(a) as being unpatentable over Araki et al., U.S. Patent No. 5,882,994.

These rejections are stated "to be maintained as stated in the office action mailed 10/11/00." However, this is not sufficient to support these rejections for a number of reasons, as discussed and/or repeated below. Substantive response to Applicant's arguments is required, as noted below, together with citation of appropriate authority for this position, and has not been provided. Clarification of the rejection is requested.

Claims 44-50 are stated, in a section entitled "double patenting" to be objected to under 37 CFR 1.75 as being a substantial duplicate of claims 25-31. The Examiner is mistaken on multiple grounds.

First, claim 44 is of different scope than claim 25. The Examiner may note that the first clause of claim 44 following the transition language includes recitation of aspects of the invention not found in any of claims 25-31. Specifically, claim 44 recites "forming a first layer of polysilicon to a first thickness on a gate dielectric disposed on a substrate", with the underlined portions finding no counterpart anywhere in claims 25-31. Accordingly,

claims 44-50 are of different scope than claims 25-31 and are not substantially duplicative thereof as mistakenly alleged in the Office Action.

Second, Applicants are entitled to claims of varying scope. This is set forth in, among other places, MPEP §706.03(k), entitled "Duplicate Claims". This MPEP section states that "Inasmuch as a patent is supposed to be limited to only one invention or, at most, several closely related indivisible inventions, limiting an application to a single claim, or a single claim to each of the related inventions might appear to be logical as well as convenient. However, court decisions have confirmed applicant's right to restate (i.e., by plural claiming) the invention in a reasonable number of ways. Indeed, a mere difference in scope between claims has been held to be enough."

Accordingly, the Examiner's characterization of the relationship between claims 25-31 and 44-50 is mistaken. Applicants are entitled to present claims of varying scope and have properly exercised this right. Accordingly, the statement in the Office Action (p. 3) to the effect that "should claims 25-31 be found allowable, claims 44-50 will be objected to under 37 CFR 1.75 as being a substantial duplicate thereof" is in error, has no basis in law, is unsupported by any authority and should be withdrawn.

The §102 rejection of claims 1, 2, 7, 9, 41, 42 and 51-57 is believed to be in error. Specifically, the PTO and Federal Circuit provide that §102 anticipation requires that each and every element of the claimed invention be disclosed in a single prior art reference. In re Spada, 911 F.2d 705, 15 USPQ2d 1655 (Fed. Cir. 1990). The corollary of this rule is that the absence from a cited §102 reference of any claimed element negates the anticipation.

Kloster Speedsteel AB, et al. v. Crucible, Inc., et al., 793 F.2d 1565, 230 USPQ 81 (Fed. Cir. 1986). No §103 rejection has been lodged regarding claims 1, 2, 7, 9, 41, 42 and 51-57. Accordingly, if Applicants can demonstrate that the Araki et al. reference does not disclose any one claimed element with respect to claims 1, 2, 7, 9, 41, 42 and 51-57, the §102 rejections must be withdrawn, and a subsequent non-final action made with a different rejection in the event that the Examiner still finds such claims to be not allowable.

Claim 1 recites "forming a floating gate over a substrate, the floating gate having an inner first portion and an outer second portion; and providing conductivity enhancing impurity in the inner first portion to a greater concentration than conductivity enhancing impurity in the outer second portion", which is not taught or disclosed by Araki et al. Similarly, claim 9 recites "forming a first layer of conductively doped semiconductive material over a semiconductive substrate; forming a second layer of substantially undoped semiconductive material over the first layer", which is not taught or disclosed by Araki et al.

Araki et al. teach (col. 3, lines 23-25 and 31-36), formation of a floating gate comprising three layers, "such as non-doped polysilicon/impurity doped polysilicon/non-doped polysilicon." Araki et al. teach (col. 1, lines 56-64) that it is undesirable to form a first layer of a floating gate from doped polysilicon, because then "phosphorus within floating gate 84 is diffused into the cell gate oxide film" and because "it invokes a problem concerning reliability due to an increase in the leak current."

The Office Action of Oct. 2000 states (p. 2) that "With respect to claims 1, 2, 7 and 9, the claims do not require the doped polysilicon layer to be in contact with the gate dielectric." However, claim 51 does explicitly recite "providing conductivity enhancing impurity in the inner first portion to a greater concentration than conductivity enhancing impurity in the outer second portion wherein forming a floating gate over a substrate comprises: forming the inner first portion in contact with a gate dielectric". Accordingly, no reasonable basis for the anticipation rejection of claim 51 has been provided. For at least these reasons, the anticipation rejection of claim 51 is clearly in error and should be withdrawn, and claim 5 should be allowed.

The Office Action of Oct. 2000 states (p. 2) that "With respect to claims 41, 42 and 51, the claims do not require that the inner first portion be uniformly doped." This is irrelevant. It has no bearing on anything found in either Applicant's claims or in Araki et al., and both the instant Office Action and the Office Action of Oct. 2000 fail to make any effort whatsoever to relate the subject matter of claim 51 to either anything taught by Araki et al. or contained in the Office Action. Araki et al. explicitly teach formation of three layers having specific properties for specific reasons. The Examiner has failed to show that the subject matter of Applicant's claims is identically disclosed in Araki et al. as is required, as a matter of law, in order to find anticipation. For at least these reasons, the rejection of claims 41, 42 and 51 is defective and should be withdrawn, and claims 41, 42 and 51 should be allowed.

Claim 1 recites "forming a floating gate over a substrate, the floating gate having an inner first portion and an outer second portion; and providing conductivity enhancing impurity in the inner first portion to a greater concentration than conductivity enhancing impurity in the outer second portion", which is not taught or disclosed by Araki et al.

Similarly, claim 9 recites "forming a first layer of conductively doped semiconductive material over a semiconductive substrate; forming a second layer of substantially undoped semiconductive material over the first layer", which is not taught or disclosed by Araki et al.

The Office Action of Oct. 2000 states (p. 3) that "Specifically, applicant argues that Araki discloses a three layered structure of non-doped, doped, and non-doped polysilicon to form the floating gate. The first two layers of Araki's floating gate structure can be characterized as one layer. The layer is in contact with the gate dielectric and is conductively doped." The Examiner is mistaken on multiple grounds.

The purpose of 35 U.S.C. §102 is to prevent an applicant from claiming subject matter that is already in the public domain. As a result, the PTO and Federal Circuit provide that §102 anticipation requires that each and every element of the claimed invention be disclosed in a single prior art reference. In re Spada, 911 F.2d 705, 15 USPQ2d 1655 (Fed. Cir. 1990).

Applicants note the requirements of MPEP §2131, entitled "Anticipation - Application of 35 U.S.C. 102". This MPEP section states, in a subsection entitled "TO ANTICIPATE A CLAIM, THE REFERENCE MUST TEACH EVERY ELEMENT OF THE CLAIM" that "A claim is anticipated only if each

and every element as set forth in the claim is found, either expressly or inherently described, in a single prior art reference." Verdegaal Bros. v. Union Oil Co. of California, 814 F.2d 628, 631, 2 USPQ2d 1051, 1053 (Fed. Cir. 1987).

"The identical invention must be shown in as complete detail as is contained in the ... claim." Richardson v. Suzuki Motor Co., 868 F.2d 1226, 1236, 9 USPQ2d 1913, 1920 (Fed. Cir. 1989). The elements must be arranged as required by the claim, but this is not an ipsissimis verbis test, i.e., identity of terminology is not required. In re Bond, 910 F.2d 831, 15 USPQ2d 1566 (Fed. Cir. 1990).

The rejection of claims 1, 2, 7, 9, 41, 42 and 51 is defective at least because it fails to conform to the principles outlined by the courts and summarized in the MPEP for anticipation under 35 U.S.C. §102.


The principles outlined above are further reinforced by MPEP §2121.01, entitled "Use of Prior Art in Rejections Where Operability Is In Question". This MPEP section states that "In determining that quantum of prior art disclosure which is necessary to declare an applicant's invention 'not novel' or 'anticipated' within section 102, the stated test is whether a reference contains an 'enabling disclosure'...." In re Hoeksema, 399 F.2d 269, 158 USPQ 596 (CCPA 1968). A reference contains an "enabling disclosure" if the public was in possession of the claimed invention before the date of invention.

→ Araki does not provide an enabling disclosure of the invention as recited in any of these claims, as is evidenced by comparison of what Araki

does in fact teach, the claims and the completely inappropriate mischaracterization of what Araki et al. do in fact teach that is found in the Office Action of Oct. 2000.

The Office Action of Oct. 2000 states that the first two layers taught by Araki et al. "may be considered to be a single, doped layer." However, Araki et al. teach (col. 3, lines 23-25 and 31-36) formation of a floating gate comprising three layers, "such as non-doped polysilicon/impurity doped polysilicon/non-doped polysilicon."

Araki et al. teach (col. 1, lines 56-64) that it is undesirable to form a first layer of a floating gate from doped polysilicon, because then "phosphorus within floating gate 84 is diffused into the cell gate oxide film" and because "it invokes a problem concerning reliability due to an increase in the leak current."



Accordingly, Araki et al. do not provide an enabling disclosure of the invention as recited in any of claims 1, 2, 7, 9, 41, 42 and 51. For at least these reasons, the anticipation rejection of claims 1, 2, 7, 9, 41, 42 and 51 is defective and should be withdrawn, and claims 1, 2, 7, 9, 41, 42 and 51 should be allowed.

The Office Action of Oct. 2000 states (p. 3) that "Araki [sic] discloses a dopant concentration of $1 \times 10^{20} \text{ cm}^{-3}$ in the first layer and a dopant concentration of none in the second layer (Col. 5, lines 14-17)." The Office Action of Oct. 2000 is mistaken.

The quoted text is reproduced below:

In this embodiment, the distribution of impurity density in polysilicon is divided into three layers of non-doped polysilicon

layer/polysilicon layer containing phosphorus of about $1 \times 10^{20} \text{ cm}^{-3}$ /
non-doped polysilicon layer.

See also similar text appearing at col. 3, lines 20-25. Simply misreading or misunderstanding what Araki et al. do say fails to transform the teachings of Araki et al. in the manner proposed in the Office Action of Oct. 2000. Araki et al. simply do not provide the teachings relied on by the Office Action of Oct. 2000. For at least these reasons, the rejection of claims 1, 2, 7, 9, 41, 42 and 51 is improper and should be withdrawn, and these claims should be allowed.

103 → Claim 25 recites "forming a first layer of polysilicon over a substrate to a first thickness; doping the first layer to a degree sufficient to define a sheet resistance of between 300 ohm/sq. and 400 ohm/sq.; after the doping, forming a second layer of polysilicon over the first layer of polysilicon to a second thickness", which is not taught, disclosed, suggested or motivated by Araki et al.

Araki et al. teach that it is undesirable to form a first doped polysilicon layer in forming a floating gate transistor, for reasons noted above. It is a main intent of Araki et al. to provide a first layer that is undoped, and this is done for the intended purpose of separating the doped layer from the gate oxide. Applicants note that MPEP §2143.01 indicates that "THE PROPOSED MODIFICATION CANNOT RENDER THE PRIOR ART UNSATISFACTORY FOR ITS INTENDED PURPOSE", and that if the modification does render the prior art unsatisfactory for its intended purpose, there is no suggestion or

motivation to make the proposed modification. In re Gordon, 733 F.2d 900, 221 USPQ 1125 (Fed. Cir. 1984).

Applicants further note the requirements of MPEP §145(X), entitled "ARGUING IMPROPER RATIONALES FOR COMBINING REFERENCES", section D(2), which states, inter alia, that "It is improper to combine references where the references teach away from their combinations."

Applicants additionally note the requirements of MPEP §2141.02, entitled "Differences Between Prior Art and Claimed Invention", stating that "PRIOR ART MUST BE CONSIDERED IN ITS ENTIRETY, INCLUDING DISCLOSURES THAT TEACH AWAY FROM THE CLAIMS".

This MPEP section further states that "A prior art reference must be considered in its entirety, i.e., as a whole, including portions that would lead away from the claimed invention. W.L. Gore & Associates, Inc. v. Garlock, Inc., 721 F.2d 1540, 220 USPQ 303 (Fed. Cir. 1983), cert. denied, 469 U.S. 851 (1984)".

→ Araki et al. teach directly away from any such disclosure. Araki et al. teach that doping of the first layer, that is, the layer immediately atop the gate dielectric, is inappropriate.

Moreover, if one does, arguendo, assume that it is appropriate to construe the teachings of Araki et al. as suggested in the Office Action, the dopant, which Araki explicitly teaches is contained in the second layer, must somehow be distributed into the first and second layers, with the logical result that the dopant concentration is decreased because it is now spread over a larger volume than is taught by Araki et al. How does the Examiner propose

to evaluate the resultant concentration? By what rationale does the Examiner justify this? What teaching is there contained within Araki to provide guidance for these modifications, or to indicate the desirability of making these modifications? The Examiner has identified no such guidance in Araki et al. for the simple reason that Araki et al provide no such guidance.

Applicants note the requirements of MPEP §2145, entitled "Consideration of Applicant's Rebuttal Arguments", at subsection X entitled "ARGUING IMPROPER RATIONALES FOR COMBINING REFERENCES" in sub-subsection (B), entitled "Obvious To Try Rationale". This MPEP section states that "An applicant may argue the examiner is applying an improper 'obvious to try' rationale in support of an obviousness rejection. "The admonition that 'obvious to try' is not the standard under Section 103 has been directed mainly at two kinds of error."

This MPEP section further states that "In some cases, what would have been 'obvious to try' would have been to vary all parameters or try each of numerous possible choices until one possibly arrived at a successful result, where the prior art gave either no indication of which parameters were critical or no direction as to which of many possible choices is likely to be successful In others, what was 'obvious to try' was to explore a new technology or general approach that seemed to be a promising field of experimentation, where the prior art gave only general guidance as to the particular form of the claimed invention or how to achieve it." In re O'Farrell, 853 F.2d 894, 903, 7 USPQ2d 1673, 1681 (Fed. Cir. 1988) (citations omitted) (The court held the claimed method would have been obvious over the prior art relied upon

because one reference contained a detailed enabling methodology, a suggestion to modify the prior art to produce the claimed invention, and evidence suggesting the modification would be successful.). See the cases cited in O'Farrell for examples of decisions where the court discussed an improper "obvious to try" approach. See also In re Eli Lilly & Co., 902 F.2d 943, 14 USPQ2d 1741 (Fed. Cir. 1990) and In re Ball Corp., 925 F.2d 1480, 18 USPQ2d 1491 (Fed. Cir. 1991) (unpublished) for examples of cases where appellants argued that an improper "obvious to try" standard was applied, but the court found that there was proper motivation to modify the references."

There is simply no teaching or guidance within Araki et al. to attempt to modify Araki et al. as suggested by the Office Action of Oct. 2000.

Further, simply stating a conclusion that "it would have been obvious" to combine teachings from references does not meet the standards for a rejection under 35 U.S.C. §103(a) as set forth in The Manual of Patent Examination Procedure at §706.02(j) entitled "Contents of a 35 U.S.C. 103 Rejection." This MPEP section states that three basic criteria must be met in order to establish a prima facie case of obviousness.

The first of these is that there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art to modify the reference or to combine reference teachings. The Office Action fails to show that the subject matter of any of Applicants pending claims is suggested or motivated by the teachings of the reference.

The second requirement of MPEP §706.02(j) is that there must be a reasonable expectation of success. The third requirement is that the prior art reference (or references when combined) must teach or suggest all of the claim limitations.

Since all of the cited references are silent with respect to a floating gate transistor with the first layer being doped, combining their teachings cannot possibly provide the invention as recited in any of Applicant's claims.

As a result, there cannot possibly be a reasonable expectation of success from combining the teachings of the references. The unpatentability rejection of the claims fails all three components of the test for an obviousness rejection as set forth in the MPEP.

Further, no evidence has been provided as to why it would be obvious to modify the Araki et al. reference. Evidence of a suggestion to combine [or modify] may flow from the prior art references themselves, from the knowledge of one skilled in the art, or from the nature of the problem to be solved. However, this range of sources does not diminish the requirement for actual evidence. Further, the showing must be clear and particular. See In re Dembiczak, 175 F.3d 994, 998 (Fed. Cir. 1999).

Accordingly, the rejection of claim 25 should be withdrawn, and claim 25 should be allowed.

Dependent claims 2-8, 10-14, 26-31, 41-43 and 52-57 are allowable as depending from allowable base claims and for their own recited features which are neither shown nor suggested by the prior art.

Additionally, the Examiner's response to argument is deficient in multiple regards. A first deficiency is that the response to argument clearly fails to respond to Applicant's arguments with respect to the rejections under 35 U.S.C. §102, or, in the alternative, is an admission that these rejections are defective. One reason for this is that the Examiner utterly and improperly fails to respond to Applicant's arguments.

Applicants note the requirements of MPEP §707.07, entitled "Completeness and Clarity of Examiner's Action". This MPEP section cites 37 CFR §1.104, entitled "Nature of examination" which in turn states, in subsection (b), entitled "Completeness of examiner's action" that "The examiner's action will be complete as to all matters, except that in appropriate circumstances, such as misjoinder of invention, fundamental defects in the application, and the like, the action of the examiner may be limited to such matters before further action is made."

This MPEP section further states, under a heading labeled "Examiner Note" that "The Examiner must, however, address any arguments presented by the applicant which are still relevant to any references being applied." The Office Action clearly fails to comport with these requirements as set forth in the MPEP, at least because the Office Action both fails to address Applicant's arguments with respect to anticipation and continues to reject claims as being anticipated.

A second deficiency is that the even under the unpatentability rejections, the combinations fail to provide all of the features recited in any

of Applicant's independent claims. The Examiner has ignored these features without providing any appropriate legal basis for doing so.

A third deficiency is the failure to respond to all arguments traversing the unpatentability rejections. Merely repeating that "it would be obvious" to provide the features recited in the claims does not constitute a basis for rejection of the claims.

This is particularly true when, as here, the references fail to provide the features recited in the claims. Additionally, the rejections fail to meet the standards for such rejections as set forth in the MPEP and as demonstrated by Applicant.

A fourth deficiency is to state, as the Examiner states at p. **"It has been well settled that mere optimization of result effective variables [sic] is deemed as an obvious modification of the prior art"** when main intentions of the cited reference are defeated by the combination. The Examiner has completely and improperly failed to respond to Applicant's repeated legal arguments showing this to be the case.

For at least these reasons, the Office Action fails to comport with appropriate standards for examination. The Examiner should either allow Applicant's claims or provide a meaningful basis for rejection and an appropriate response to Applicant's arguments.

In view of the foregoing, allowance of claims 1-14, 25-31 and 41-57 is requested. The Examiner is requested to phone the undersigned in the event that the next Office Action is one other than a Notice of Allowance. The

undersigned is available for telephone consultation at any time during normal business hours (Pacific Time Zone).

Respectfully submitted,

Dated: July 9, 2001

By: 
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